R E P O R T R E S U M E S

ED 011 013 SP 000 790

TELEWRITER STUDY, SPRING SEMESTER, 1966.

BY- BISBEY, GERALD D. AND OTHERS
STATE COLL. OF IOWA, CEDAR FALLS

REPORT NUMBER RR-117 PUB DATE 4 JAN 67
EDRS PRICE MF-$0.09 HC-$0.52 13P.

DESCRIPTORS- *COLLEGE INSTRUCTION, *ELECTROMECHANICAL AIDS, *MATHEMATICS, CEDAR FALLS

TO DETERMINE IF MECHANICAL AIDS CAN BE OF SIGNIFICANT HELP IN THE TEACHING OF COLLEGE MATHEMATICS, A TELEWRITER (FACSIMILE TELEGRAPH FOR REPRODUCING GRAPHIC MATERIAL) WAS USED TO TEACH EIGHT SESSIONS OF A 16-SESSION EXTENSION COURSE (EXPERIMENTAL GROUP) IN FOUNDATIONS IN ARITHMETIC. TWO CONTROL GROUPS, ONE ON- AND ONE OFF-CAMPUS, WERE TAUGHT WITHOUT THE TELEWRITER. IN THE EXPERIMENTAL GROUP A COORDINATOR WHO WAS A QUALIFIED TEACHER WAS ALWAYS PRESENT IN THE ROOM TO MONITOR THE EQUIPMENT. EXPERIMENTAL AND CONTROL GROUPS DID NOT DIFFER IN PRETEST SCORES OF MENTAL MATURITY. ON MIDTERM AND FINAL CRITERION TESTS, THE EXPERIMENTAL GROUP WAS SIGNIFICANTLY SUPERIOR TO THE OFF-CAMPUS CONTROL GROUP BUT NOT TO THE ON-CAMPUS CONTROL GROUP. HOWEVER, 88 PERCENT OF THE EXPERIMENTAL GROUP STUDENTS PREFERRED A LIVE TEACHER TO THE TELEWRITER. MANY FELT THE SUCCESS OF THE TELEWRITER WAS AT LEAST PARTIALLY DUE TO THE PRESENCE OF THE COORDINATOR, WHO OFTEN AIDED IN TEACHING THE SUBJECT. (AW)

ED011013

JAN 30 1967
copy 2
A9

Research Report No. 117

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

Telewriter Study
Spring Semester 1966

SP 000 790

Bureau of Research and Examination Services
State College of Iowa
Cedar Falls, Iowa

TELEWRITER STUDY
STATE COLLEGE OF IOWA
SPRING SEMESTER, 1966

RESEARCH REPORT NO. 117

Bureau of Research and Examination Service
State College of Iowa
Cedar Falls, Iowa

Gerald D. Bisbey
Associate in Research
et al.

January 4, 1967

I. Introduction

This study was motivated by Dr. Raymond Schlicher, Director of the Extension Service at the State College of Iowa, to investigate the feasibility of using the telewriter as an aid in the teaching of an extension course in Foundations in Arithmetic, 80:130, and consists essentially of two parts.

Part 1 is the comparison of two off-campus 80:130 classes with each other. One of these classes uses the telewriter and is called the experimental group. The other class is called the control group. Part 2 compares the experimental group with an on-campus control group.

II. Populations and Samples

The population for Part 1 consists of those students who have, or would be eligible to take this extension course from the State College of Iowa, who are not over 50 years old, and who have taught or are teaching.

The population for Part 2 is extended beyond Part 1 to include those students who have had no teaching experience, but are elementary majors; who have had no more than two years of high school mathematics, and who have not taken any more math beyond 80:20 in college. It is restricted in that it includes only females, since the number of males was so few.

The sample, from the population described above and used for Part 1, consisted of two intact extension classes conducted, one at Cedar Rapids, Iowa, and one at Montezuma, Iowa, during the Spring semester of 1966. The students included in this sample must have taken the course for college credit.

The sample used for Part 2 consists of the female students registered for the extension classes and also those female students registered for the on-campus courses who satisfied the criteria outlined under populations above. Again, these students must have received college credit for this course.

III. Procedure

The Cedar Rapids extension class was designated the experimental group with one-half of the teaching classes, eight three hour sessions, being conducted from the State College of Iowa campus via telephone using the telewriter. The other half was conducted on a face-to-face basis, for eight three hour sessions, as in the past. A coordinator, whose main purpose was to keep the telewriter equipment working, was always present in the room. He was not considered as a teacher of the class, but was an experienced junior high school mathematics teacher.

The Montezuma, Iowa extension class was taught by a different teacher and was used as the control group for Part 1. It was taught on a face-to-face basis, for sixteen three hour sessions, as in the past.

The on-campus group was selected from four 80:130 classes taught by as many teachers, and was considered as the control group for Part 2. The method of teaching was face-to-face as in the past.

The College Level Henmon-Nelson Test of Mental Maturity (short form) was given to all students participating in the study to ascertain their ability level. A common academic proficiency test was given at mid-term and again for the final.

An inventory was given to all members of the experimental group at the end of the semester to obtain some information about their attitudes regarding the course being taught. (See page 9)

IV. The Hypotheses

There were, basically, two hypotheses to be tested; (1) There is no statistically significant difference between the off-campus control and the experimental groups when comparing differing instructional procedures, and (2) There is no statistically significant difference between the experimental and the on-campus control group when comparing differing instructional procedures.

V. Findings

Tables 1 and 2, below, show that the distributions are essentially the same for each group, for the Henmon-Nelson Test. The breakdown by quartile would seem to imply that the distributions of scores for these variables are not the same. However, Tables 3-5, below, indicate that there is no reason to assume otherwise. In general then, we can conclude that all students used in this study have approximately the same level of mental maturity as measured by this test.

Table 6, below, indicates a significant difference between the instructional procedures for the mid-term and the final examinations between the off-campus groups when sex is not controlled.

Table 7, below, indicates a significant difference between these instructional procedures between the off-campus groups when sex is controlled and the final examination score is used as a criterion.

Table 8, below, shows no significant difference between the instructional procedures when the experimental and on-campus groups are compared.

TABLE 1

FREQUENCY DISTRIBUTION WITH PERCENT OF STUDENTS FALLING INTO EACH QUARTILE (BASED ON NATIONAL NORMS) FOR THE SPRING 1966 STATE COLLEGE OF IOWA EXTENSION CLASSES AND A SELECTED FEMALE GROUP OF ON-CAMPUS STUDENTS IN 80:130 BASED UPON THE HENMON-NELSON TEST OF MENTAL MATURITY (COLLEGE LEVEL)

Control N = 23				Experimental N = 48				On-Campus N = 41			
Q-Score		V-Score		Q-Score		V-Score		Q-Score		V-Score	
%	Qt. RS f	%	Qt. RS f	%	Qt. RS f	%	Qt. RS f	%	Qt. RS f	%	Qt. RS f
4.3	1 9 1	4.3	1 16 1	0.	1 0	0.	1 0	2.4	1 10 1	0.	1 0
			18 1				18 1				
			19 1		12 3		21 1		12 1		
21.7	2 12 1	30.4	2 23 2	14.6	2 14 1	12.5	2 22 1	9.8	2 13 1	2.4	2
	13 2		24 1		15 2		24 2		14 1		
	14 2		25 2		16 1		25 1		16 1		22 1
											26 1
											27 1
					17 3				17 3		28 1
34.8	3 17 1	17.4	3 29 1	31.3	3 18 5	16.7	3 28 2	51.2	3 18 6	29.3	3 29 4
	19 3		31 1		19 3		30 3		19 5		30 2
	20 3		32 1		20 1		31 2		20 5		31 2
	21 1		33 1		21 3		32 1		21 2		32 1
							34 4				
							35 4				34 5
							37 1				35 1
							38 4				36 1
							39 1				37 2
							40 2				38 5
					22 3		41 1				39 3
					23 3		42 3				40 2
					24 4		44 1				41 1
					25 1		45 3		22 4		42 1
39.1	4 22 1	47.8	4 35 1	54.2	4 26 4	70.8	4 46 2	36.6	4 24 2	68.3	4 43 1
	24 2		38 1		27 3		49 2		25 2		45 1
	25 1		43 2		28 1		50 1		26 2		46 1
	26 1		44 3		29 3		51 2		27 1		47 1
	29 1		46 2		30 2		52 1		28 2		48 1
	30 1		47 1		31 1		53 1		29 1		49 1
	31 2		54 1		35 1		54 1		30 1		53 1
Mean	20.5		34.0		22.1		37.5		20.5		36.3
S.D.	6.3		10.8		5.3		9.0		4.5		6.8

TABLE 2

FREQUENCY DISTRIBUTION WITH PERCENT OF FEMALE STUDENTS FALLING INTO EACH QUARTILE (BASED ON NATIONAL NORMS) FOR THE SPRING 1966 STATE COLLEGE OF IOWA EXTENSION CLASSES AND SELECTED FEMALE GROUP OF ON-CAMPUS STUDENTS IN 80:130 BASED UPON THE HENMON-NELSON TEST OF MENTAL MATURITY (COLLEGE LEVEL)

Control N = 14				Experimental N = 37				On-Campus N = 41			
Q-Score		V-Score		Q-Score		V-Score		Q-Score		V-Score	
%	Qt. RS f	%	Qt. RS f	%	Qt. RS f	%	Qt. RS f	%	Qt. RS f	%	Qt. RS f
0.	1 0	7.1	1 16 1	0.	1 0	0.	1 0	2.4	1 10 1	0.	1 0
							18 1				
					12 2		21 1		12 1		
21.4	2 12 1	35.7	2 18 1	16.2	2 14 1	16.2	2 22 1	9.8	2 13 1	2.4	2
	13 1		23 2		15 2		24 2		14 1		
	14 1		25 2		16 1		25 1		16 1		22 1
											26 1
											27 1
42.9	3	7.1	3	27.0	3 17 3	13.5	3	51.2	3 17 3	29.3	3 28 1
	17 1				18 3		28 1		18 6		29 4
	19 2				19 1		30 2		19 5		30 2
	20 2				20 1		31 1		20 5		31 2
	21 1		32 1		21 1		32 1		21 2		32 1
											34 5
							34 2				35 1
							35 3				36 1
							37 1				37 2
							38 3				38 5
					22 2		39 1				39 3
					23 3		40 1				40 2
35.7	4	50.0	4	56.8	4 24 4	70.3	4 41 1	36.6	4	68.3	4 41 1
					25 1		42 3		22 4		42 1
					26 2		45 3		24 2		43 1
					27 3		46 1		25 2		45 1
			38 1		28 1		49 2		26 2		46 1
	24 2		44 2		29 2		50 1		27 1		47 1
	25 1		46 2		30 1		51 2		28 2		48 1
	30 1		47 1		31 1		52 1		29 1		49 1
	31 1		54 1		35 1		53 1		30 1		53 1
Mean	20.6		34.4		22.1		37.6		20.5		36.3
S.D.	5.6		12.1		5.5		9.5		4.5		6.8

TABLE 3

χ^2 TEST OF INDEPENDENCE BETWEEN THE CONTROL AND EXPERIMENTAL GROUPS BY THE SECOND, THIRD, AND FOURTH QUARTILES FOR Q-AND V-SCORES OF THE HENMON-NELSON TEST OF MENTAL MATURITY (COLLEGE LEVEL)

	Quartiles Q-Score				Quartiles V-Score			
	2	3	4		2	3	4	
Control	5 (3.77)	8 (7.23)	9 (11.00)	22	7 (4.09)	4 (3.77)	11 (14.14)	22
Experimental	7 (8.23)	15 (15.77)	26 (24.00)	48	6 (8.91)	8 (8.23)	34 (30.86)	48
	12	23	35	70	13	12	45	70
	χ^2_f = 1.23		df = 2		χ^2_f = 4.07		df = 2	

TABLE 4

χ^2 TEST OF INDEPENDENCE BETWEEN THE CONTROL AND EXPERIMENTAL FEMALE GROUPS BY THE SECOND, THIRD, AND FOURTH QUARTILES FOR Q-AND V-SCORES OF THE HENMON-NELSON TEST OF MENTAL MATURITY (COLLEGE LEVEL)

	Quartiles Q-Score				Quartiles V-Score			
	2	3	4		2	3	4	
Control	3 (3.15)	6 (5.25)	5 (9.10)	14	5 (3.58)	1 (1.95)	7 (10.73)	13
Experimental	6 (8.10	9 (13.50)	21 (23.40)	36	6 (10.18)	5 (5.55)	26 (30.53)	37
	9	15	26	40	11	6	33	40
	χ^2_f = 4.25		df = 2		χ^2_f = 4.76		df = 2	

TABLE 5

χ^2 TEST OF INDEPENDENCE BETWEEN THE CONTROL, EXPERIMENTAL, AND ON-CAMPUS FEMALES BY THE SECOND, THIRD, AND FOURTH QUARTILES FOR Q-AND V-SCORES OF THE HENMON-NELSON TEST OF MENTAL MATURITY (COLLEGE LEVEL)

	Quartiles Q-Score				Quartiles V-Score			
	2	3	4		2	3	4	
Control	3 (2.02)	6 (5.60)	5 (6.37)	14	5 (1.86)	1 (2.80)	7 (9.18)	14
Experi-mental	6 (5.20)	9 (14.40)	21 (16.40)	36	6 (4.80)	5 (7.20)	25 (23.60)	36
On-Campus	4 (5.78)	21 (16.00)	15 (18.22)	40	1 (5.33)	12 (8.00)	27 (26.22)	40
	13	36	41	90	12	18	59	90

$\chi^2_f = 6.91$ df = 4 $\chi^2_f = 14.86^*$ df = 4

*Significant at the .05 level of confidence

TABLE 6

THE COMPARISON OF THE CONTROL AND EXPERIMENTAL GROUPS ON THE CRITERION VARIABLES USED IN THE STUDY

	Control N = 21		Experimental N = 40		
Variables	Mean	S.D.	Mean	S.D.	t-Ratio
Mid-Term Exam.	35.8	8.0	40.1	6.5	2.33*
Final Exam	26.4	7.2	32.2	7.0	3.63*

*Significant at the .05 level of confidence (two tailed test)

TABLE 7

TWO-FACTOR ANALYSIS OF VARIANCE
BETWEEN INSTRUCTIONAL PROCEDURES AND SEX FOR OFF-CAMPUS GROUPS
USING THE FINAL EXAMINATION SCORES FOR MALE & FEMALE STUDENTS AS A CRITERION

SUMMARY TABLE

Source	df	SS	MS
Method	1	390.34	390.34
Sex	1	179.62	179.62
Cells	3	572.77	190.92
Interaction	1	2.79	2.79
Within	42	1878.44	44.72
Total	45	2451.21	

Method Effect F - Ratio = 8.73* df (1, 42)
Interaction Effect F - Ratio = 0.06, df (1, 42)
Sex Effect F - Ratio = 4.02, df (1, 42)

*Significant at the .05 level of confidence

TABLE 8

THE COMPARISON OF THE ON-CAMPUS CONTROL GROUPS WITH THE EXPERIMENTAL GROUPS, FOR FEMALES ONLY, USING THE FINAL AND THE MID-TERM EXAMINATION SCORES AS THE CRITERION VARIABLES

	Exp. N=33		On-Campus N=32		t-Ratio
Variables	M	SD	M	SD	
Mid-Term Exam.	39.7	6.7	36.7	5.7	1.92
Final	31.6	7.2	30.4	6.3	0.67

*Significant at the .05 level of confidence (two tailed test)

The "Information for the Instructor" inventory handed out to the students participating in the experimental group is found on page 9.

Thirty-four inventories were returned (73%). All thirty-four inventories agreed that the success of the telewriter sessions depended upon the assistant present at the meetings being able to both teach the subject and assist.

88% of those responding to the inventory indicated that they preferred the face-to-face part of the class better.

15% of those responding to the inventory indicated that they had participated in at least one in-service course or session during the past five years.

Even though the amount of testing time varied between the control and the experimental groups, 50% of those responding to the inventory indicated that the testing time was about right while 26% indicated too little time.

29% of those responding to the inventory indicated that they were able to take some of the work done in the experimental class directly into their classroom situation, while 26% indicated much.

VI. Conclusions

It would seem that the telewriter could be used in conjunction with face-to-face meetings in an extension class without seriously affecting the results.

One should not conclude that the telewriter with face-to-face meetings will do a better job of presenting the concepts than face-to-face alone; nor should one conclude that the telewriter can be used successfully by itself, i.e., without face-to-face meetings.

It would be better to design a study taking into account more of the variables not controlled upon in this study to determine if these results are indeed correct.

A further study would be needed to determine if the telewriter might be used for large classes without face-to-face contact.

INFORMATION FOR THE INSTRUCTOR

1. Name _____
   Last First Middle or maiden name

2. Course: Mathematics 80:130g being taught at _____

3. An arithemetic text(s) used this year at your school: please check

   _____ Scott Froseman
   _____ SRA
   _____ Laidlaw
   _____ Winston
   _____ Other (Please name) _____

4. What, if any, credit or non-credit in-service courses or sessions have you participated in during the past five years?

   Instructor A _____
   Date
   Instructor B _____
   Date
   Instructor C _____
   Date
   Other - please identify _____
   Date

5. Was the time allowed for the examination sufficient?

   _____ about right
   _____ too much
   _____ too little
   _____ Estimate of actual time used for the mid-term examination

6. Have you been able to take any of the work done in this extension class directly into your classroom work with your children?

   _____ little
   _____ some
   _____ much

7. Compare the in-service classes you have conducted by telewriter with those held face-to-face.

   _____ I liked the telewriter class better
   _____ I liked the face-to-face class better
   _____ I feel there is no difference

8. How much did success of the telewriter sessions depend upon the assistant present at your meetings?

   _____ Anyone could do what he did.
   _____ Such a person needs to be able to both teach the subject and assist.
   _____ It would be better with just a student running the telewriter equipment and making no comments on the subject being taught